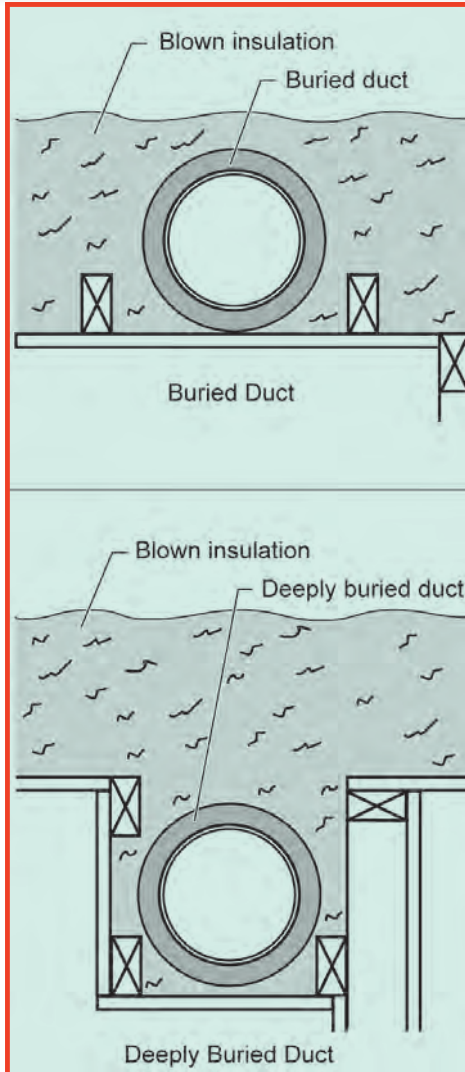


Questions and Answers Residential



Q. For the 2005 Standards there is a new compliance credit for “ducts buried in attic insulation.” What must be done to qualify for that credit?

A. Effective October 1, 2005, you can only receive credit for “buried ducts” if the work is done in combination with two additional compliance measures: quality installation of insulation and duct sealing. When taking the buried duct credit, a minimum of R-30 insulation must be blown after the HVAC ducts are installed. Prior to being buried, the ducts must have at least R-4.2 duct insulation. Only the portions of duct runs that are directly on or within 3.5 inches of the ceiling gypsum can take credit for increased effective duct insulation. Note that ducts resting either directly on the ceiling gypsum or within 3.5 inches of the ceiling gypsum, resting on ceiling joists or truss supports, satisfy this requirement and also meet the support requirements for flexible ducts in the California Mechanical Code, Standard 6-5, Section 6.509 (d). As long as the spacing between support does not exceed the manufacturer’s recommended intervals, no other support is required.

Credit is allowed only in areas where the ceiling is level and there is at least six inches of space between the outer jacket of the installed duct and the roof sheathing above. The duct design must identify the segments of the ducts that meet the requirements for being buried, and these segments must be input separately into approved compliance software.

Based on the type of attic insulation (blown fiberglass or blown cellulose) the R-value of the attic insulation, and the diameter of the duct, compliance software will calculate the effective duct insulation for each segment. Compliance credit also may be taken for “deeply buried ducts.” To qualify for this credit, the duct segment must be in a lowered area of the ceiling, and must be completely covered by at least 3.5 inches of attic insulation. The insulation must be a uniform depth throughout the entire area of the attic; it can’t just be mounded over the duct.

“Buried ducts” is a measure that requires field verification by a certified HERS rater (along with the other measures in the combination—quality installation of insulation, and duct sealing). The HERS rater must verify the job both before and after the attic insulation is blown. Before the insulation is blown, the HERS rater will verify that the ducts are installed as shown on the duct design, are consistent with the compliance software inputs and meet the requirements described above.

After the ceiling insulation is installed, the HERS rater will verify that the R-value and type of insulation is the same that is listed on the Duct System Details summary from the compliance software, and that the attic insulation is level and uniform, and meets the other requirements for claiming compliance credit.

BLUEPRINT

Efforts to get ready for the 2005 Residential Lighting Requirements



California Building Industry Association Lighting Design Seminars

Kudos go to ConSol for organizing a series of four lighting design seminars for the California Building Industry Association (CBIA) to “prime-the-pump” so that builders and suppliers will be fully prepared to comply with the new residential lighting requirements when they go into effect October 1, 2005.

The seminars took place in February 2005, with two held in Northern California and two in Southern California. After presentations on the new lighting requirements by Energy Commission staff, a lighting expert from the California Lighting Technology Center presented recommendations for how to achieve a quality lighting design that meets the needs of home purchasers while fully complying with the Standards.

At each of the seminars, several large production builders brought in sets of construction plans that they intend to submit to the building department within 90 days. A lighting designer from the Sacramento Municipal Utility District (at the Northern California seminars) and an independent lighting designer (at the Southern California seminars) rolled out the builder’s plans and did a tabletop review of how the designs could be modified to meet the 2005 lighting Standards.

The builders were able to walk out of the room with an understanding of the lighting products they will need to order to meet the 2005 Standards. By having these orders from builders, suppliers will be able to introduce these products well in advance of the effective date.

Manufacturers and suppliers also came to these seminars to present products that can be used to comply with the Standards. These included representatives from Cooper Lighting, the Watt Stopper, Designers Fountain, Mission Lighting, Progress Lighting, Lutron, and Sea Gull Lighting Products.

Design Guidelines for Home Builders

On another front, the California Lighting Technology Center, at the University of California, Davis, has created the “**Residential Lighting Design Guide – Best practices and lighting designs to help builders comply with California’s 2005 Title 24 energy code.**”

The Guide includes an overview of Standards requirements and design recommendations for each area of the home. The Guide is targeted to respond to the information needs of production home builders, lighting specifiers, contractors and designers. The Guide is now available and will be distributed through trade shows and a website: <http://www.cltc.ucdavis.edu/>

The Guide project is funded by the Pacific Gas and Electric Company, the Sacramento Municipal Utility District, San Diego Gas and Electric (Sempra Utilities), and the U.S. Environmental Protection Agency (EPA).

Energy Star®



Another breakthrough that helps make it easy for builders to comply with the 2005 lighting requirements took place when EPA updated the Energy Star® residential lighting specifications to match the new California

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residential lighting requirements. EPA released the Energy Star® Version 4.0 Residential Luminaire (lighting fixture) specifications on January 10, 2005. Energy Star® compliant luminaires must meet the new specifications, effective October 1, 2005, to coincide with the effective date for the 2005 California Standards.

The 2005 Standards require either high efficacy luminaires or specific controls when non-high efficacy luminaires are installed in residential buildings. All exterior luminaires attached to a building are required to be either high efficacy or controlled by both a photocontrol and motion sensor.

Installing Energy Star® Version 4.0 compliant luminaires will be an easy way for builders to meet California Standards. Since earlier versions of Energy Star® luminaires do not comply with the new California lighting requirements, it's important that builders make sure to purchase Energy Star® Version 4.0 luminaires.

To encourage easy identification of luminaires that meet the high efficacy requirements in the 2005 Standards, EPA and the Energy Commission are working with several manufacturers who will choose to put a standard label on their luminaires that indicates that the luminaires are both Energy Star® and compliant with the 2005 Standards. Note that the Energy Star® specification includes feature requirements that are not included in the Standards, so if a luminaire does not have the Energy Star®/Title 24 05 label, it still may very well meet the 2005 Standards requirements.

The 2005 Standards do not require Energy Star® labels to establish that a luminaire complies with the high efficacy requirements. The luminaire merely must meet the Title 24 minimum efficacy requirements, not contain a medium screw-base socket, and use an electronic ballast. For outdoor luminaires, the Energy Star® label indicates that the luminaire is either high efficacy or has the lighting controls required by the Standards.

It is important to realize that the Energy Star®/Title 24 05 label does not indicate that a luminaire meets the zero clearance insulation cover or airtight certification requirements in the Standards. Separate labels are required

Efforts to get ready for the 2005 Residential Lighting Requirements

to show that a luminaire has been approved as meeting the zero clearance insulation cover requirements, and is certified airtight according to ASTM E283.



The American Lighting Association (ALA), a national association of lighting manufacturers, has actively supported industry preparation for the new California residential lighting requirements. ALA has invited Energy Commission staff to talk with a large number of lighting luminaire manufacturers through presentations at the ALA Annual Conference in Phoenix, Arizona, and at the Annual Engineering Committee meeting in Dallas, Texas.

Additionally, ALA has included information about the California Standards in several editions of their newsletters to members. As a result, a number of luminaire manufacturers have contacted the Energy Commission for additional information. Manufacturers around the country are getting ready to deliver compliant equipment (including air tight luminaires, electronic ballasts, and occupant sensors).



The National Kitchen and Bath Association (NKBA), an organization of lighting designers that specialize in kitchen and bath lighting, also has sought to bring its members up-to-speed with the 2005 residential lighting requirements.

Energy Commission staff gave a presentation to 160 designers through the NKBA Oakland Chapter. NKBA also partnered with the International Furnishings and Design Association and the American Society of Interior Designers to have Energy Commission staff present the residential lighting standards to design students at the 2005 Student Career Forum in San Francisco.

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Residential

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Q. Do the current 2001 and 2005 Standards allow the installation of an appliance rated fireplace, through-the-wall air conditioner, or electric resistance heating unit?

A. Yes, as supplemental space conditioning equipment. Supplemental equipment does not have to be analyzed as part of building energy compliance. To be accepted as supplemental space conditioning equipment, the area served by the supplemental system must also be served by the primary heating or cooling system for the house. The primary system must have sufficient capacity to condition the entire building. If these conditions are not met, the added space conditioning equipment will not be considered supplemental and must comply with the Standards.

Supplemental heating cannot be used in areas such as bathrooms without supply vents from the primary system.

Q. Can a HERS rater sign a CF-4R without having a CF-6R from the installer or builder showing that the home meets the duct sealing requirements?

A. No. Under the 2001 and 2005 Standards, HERS raters are required to certify on the CF-4R (Certificate of Field Verification and Diagnostic Testing) that the installer (or builder) has provided a copy of the CF-6R. If the HERS rater is signing the CF-4R that they received a copy of the CF-6R when they did not, then they are in violation of the “true, accurate and complete reporting” requirements that certified HERS raters must abide by (California Code of Regulations, Title 20, Section 1672 (d)).

To claim Title 24 building energy performance standards compliance credit, you must complete the following sections of the CF-6R that require HERS rater field verification:

Duct Leakage and Design:

- Duct Sealing
- Thermostatic Expansion Valve (TXV)
- Duct Design

Duct Location and Duct Surface Area

- Ducts in Conditioned Space
- Reduced Duct Surface Area.

Building Envelope Sealing

If the CF-6R is not provided to the HERS rater, then the rater has only two options:

1. The rater may contract with the builder to do the necessary diagnostic testing on 100 percent of the homes. The rater cannot do sampling in this case. This testing would have to be done after the sheetrock was installed; it couldn't be done at rough-in. The builder or installing contractor can rely on the rater's testing to sign the CF-6R, but the rater cannot sign the CF-6R. If the rater did 100 percent testing of the homes at rough-in, it would be possible for a different rater to come in and do testing at final on a sampling basis.
2. The only other option is for the rater to delay their diagnostic testing and field verification until they are provided with a properly completed CF-6R signed by the builder or contractor.

Q. As a HERS rater I have the option to sample homes as long as I have a CF-6R from the builder or installing contractor for every house. During sampling I can test one out of every seven homes. If I test a sample home and it does not pass, can I have the HVAC subcontractor fix the system without sampling additional homes?

A. No. Chapter 4 of the 2001 Residential Compliance Manual and Chapter 7 of the 2001 and 2005 Residential ACM Manuals include specific language concerning sampling and failures:

When a HERS rater tests a system and the system fails, it must be entered into the HERS Provider registry as a failure and another home must be tested. It is a violation of the “true, accurate and complete reporting” requirements that certified HERS raters must abide by, to allow the contractor to fix the

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system, retest, and never report the original failure to the registry. It also would make invalid the sampling for that group of homes.

Once the failure has been reported to the registry, the HERS rater would notify the installer to correct the system. Then the rater would retest to make sure the system passes. The original failure must be fixed, but it is still considered a failure for sampling purposes. It must be recorded in the registry as a failure.

Whenever a home fails the first test, an additional home must be tested in accordance with sampling rules.

If the second home fails, it must be reported as a failure, and all homes in the sample group must be tested, and all must be shown to pass. If the second home passes, the CF-4Rs may be completed for untested homes in the sample group in accordance with sampling rules.

Just as in the discussion above for the first home tested in the sample, the rater is in violation of the “true, accurate and complete reporting” regulation (and destroys the validity of the sample) if the rater allows the contractor to fix the second system, and retests and then does not report the second system as a failure to the registry.

It should be relatively common for a rater to find and report failures to the registry and have to test an entire group of houses, especially for builders and contractors who are new to the process of duct sealing. If this does not happen relatively commonly, it is an indication the rater may be in violation of the “true, accurate and complete reporting” HERS regulation.

Q. When calculating the lighting power adjustment factors (control credits) in Table I46-A, and minimum skylight to daylit floor area calculations in Section I43(C), Table I43-F, can we substitute Visible Transmittance (VT) on the NFRC’s Label Certificate Performance Ratings for the Energy Commission’s Visible Light Transmittance (VLT)?

A. Yes, in both the 2001 and 2005 Standards for lighting power adjustment factor calculations in Table I46-A minimum skylight to daylit floor area of calculating in Section I43(C) and Table I43-F; VT may be substituted for VLT, including in equation I46-A, EFFECTIVE APERTURE OF SKYLIGHTS. Visible Light Transmittance (VLT) is a property of the glass or plastic glazing material only. VLT is the ratio (expressed as a decimal) of visible light that is transmitted through a glazing material to the light that strikes the material. VLT can be determined using the values listed in ASHRAE Handbook, Fundamentals Volume, Chapter 30, Table 24 or from the manufacturer’s literature. VT from NFRC includes the effects of framing, and using it to calculate the power adjustment factors in lieu of VLT results in a slightly more conservative (lower) credit levels. Note the if VT is used in lieu of VLT for the purpose of calculating the minimum skylight to daylit floor area of calculating in Section I43(C), Table I43-F, because VT values are lower than VLT values, other parameters in Equation I46-A — such as well efficiency, total skylight area, or daylit area under skylights - must be improved to achieve the desired Effective Aperture levels specified in column three of Table I43-F. For more information on how to determine VLT, refer to Section 5.2.1.4, Daylighting Controls, in the 2005 Nonresidential Compliance Manual.

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Title 24

Energy Efficiency Standards Training

Arnold Schwarzenegger
Governor

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Links for training on issues relating to California Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24, Part 6) is available on the Energy Commission's website at:

<http://www.energy.ca.gov/title24/training>

For training offered by the utilities and other organizations please see the following websites:

PG&E:

<http://www.pge.com/stockton>

SoCal Gas Co.

<http://seminars.socalgas.com/int/default.asp>

San Diego Gas and Electric

<http://seminars.sdge.com/int/default.asp>

SCE:

<http://www.sce.com/RebatesandSavings/EnergyCenters/workshops.htm>

SMUD:

<http://www.smud.org/education/index.html>

CALBO TRAINING INSTITUTE

<http://www.calbo.org>

BUILDING INDUSTRY INSTITUTE (BII)

<http://www.consol.ws/bect.asp>

CABEC:

<http://www.cabec.org/cepetrainandtest.php>

Nonresidential Fenestration Certification Initiative (NFCI)

<http://nfci.ecst.csuchico.edu>

Residential Lighting Design Guide

– Best practices and lighting designs to help builders comply with California's 2005 Title 24 energy code

<http://www.cltc.ucdavis.edu/>



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